CLAIMS

What is claimed is:

1. An apparatus for joining two tubing sections together, comprising:

a plug assembly having a plurality of splines;

a socket assembly having a plurality of receptacles adapted to receive the plurality of splines of the plug assembly;

a securing device for securing the plug assembly to the socket assembly;

wherein the plug assembly and the socket assembly may be joined in N orientations where N is equal to the number of splines.

2. The apparatus of claim 1, wherein the plurality of splines further comprises a center spline and a plurality of outer splines of equal dimensions, the outer splines sharing a common longitudinal axis with the center spline and having symmetry about the common longitudinal axis, and where N is equal to the number of outer splines.

3. The apparatus of claim 1, wherein the securing device is a coupling collar adapted for connecting it to the plug assembly and the socket assembly, the coupling collar initially engaged with the plug assembly.

4. The apparatus of claim 1, wherein the plug assembly further comprises fine threads.

5. The apparatus of claim 1, wherein the socket assembly further comprises coarse threads.

6. The apparatus of claim 5, wherein the threads of the socket assembly are tapered.

7. The apparatus of claim 1, wherein the two tubing sections are connectable in two distinct orientations.

8. The apparatus of claim 1, wherein the two tubing sections are connectable in three distinct orientations.

9. The apparatus of claim 1, wherein the two tubing sections are connectable in four or more distinct orientations.

10. The apparatus of claim 1, further comprising at least one conduit containing a wire adapted to carry an electrical current.

11. The apparatus of claim 1, further comprising at least one conduit containing material adapted to carry an optical signal.

12. The apparatus of claim 1 wherein the tubing sections are tubing.

13. The apparatus of claim 1 wherein the tubing sections are pipe.

14. The apparatus of claim 1 wherein the tubing sections are casing.

15. The apparatus of claim 1 wherein the tubing sections are used to produce hydrocarbons from a well bore.

16. The apparatus of claim 1 wherein the tubing sections are used to produce water from a well bore.

17. The apparatus of claim 1 wherein the tubing sections are connectable in a plurality of distinct orientations.

18. An apparatus for providing power to a subterranean environment, comprising:

a drilling assembly containing a plurality of tubing sections;

a plurality of tubing joints for connecting the plurality of tubing sections together, the tubing joints comprising:

a plug assembly having a plurality of splines;

a socket assembly having a plurality of receptacles, the plurality of receptacles adapted to receive the plurality of splines of the plug assembly;

at least one conduit running the length of the apparatus;

a securing device for securing the plug assembly to the socket assembly; and

wherein the plug assembly and the socket assembly may be joined in N orientations where N is equal to the number of splines.

19. The apparatus of claim 18, wherein the plurality of splines further comprises a center spline and a plurality of outer splines of equal dimensions, the outer splines sharing a common longitudinal axis with the center spline and having symmetry about the common longitudinal axis, and wherein N is equal to the number of outer splines.

20. The apparatus of claim 19, wherein the securing device is a coupling collar adapted for connection to the plug assembly and the socket assembly, the coupling collar initially engaged with the plug assembly.

21. The apparatus of claim 19, wherein the plug assembly further comprises fine threads.

22. The apparatus of claim 19, wherein the socket assembly further comprises coarse threads.

23. The apparatus of claim 22, wherein the threads of the socket assembly are tapered.

24. The apparatus of claim 19, wherein the two tubing sections are connectable in two distinct orientations.

25. The apparatus of claim 19, wherein the two tubing sections are connectable in three distinct orientations.

26. The apparatus of claim 19, wherein the two tubing sections are connectable in four or more distinct orientations.

27. The apparatus of claim 19, further comprising at least one conduit containing a wire adapted to carry an electrical current.

28. The apparatus of claim 19, further comprising at least one conduit containing material adapted to carry an optical signal.

29. The apparatus of claim 19 wherein the tubing sections are tubing.

30. The apparatus of claim 19 wherein the tubing sections are pipe.

31. The apparatus of claim 19 wherein the tubing sections are casing.

32. The apparatus of claim 19 wherein the tubing sections are used to produce hydrocarbons from a well bore.

33. The apparatus of claim 19 wherein the tubing sections are used to produce water from a well bore.

34. The apparatus of claim 19 wherein the tubing sections are connectable in a plurality of orientations.

35. A method of using a tubing joint to join two tubing sections together, comprising:

using a first tubing section with a proximate end having a plug assembly attached and a second tubing section with a distal end having a socket assembly attached, positioning the first tubing section coaxially with the second tubing section;

aligning the first tubing section with the second tubing section;

engaging the plug assembly of the first tubing section into the socket assembly of the second tubing section; and

securing the first tubing section to the second tubing section.

36. The method of claim 35 wherein the positioning step further comprises: positioning the first tubing section coaxially with the second tubing section such that the proximate end of the first tubing section is in close proximity with the distal end of the second tubing section.

37. The method of claim 35 wherein the positioning step further comprises:

aligning the first tubing section with the second tubing section by rotating one or both tubing sections such that the plug assembly outer splines of the first tubing section are positioned to properly mate with the receptacle in the socket assembly of the second tubing section.

38. The method of claim 35 wherein the first tubing section is vertically above the second tubing section.

39. The method of claim 35 wherein a pair of electrical connectors are electrically coupled when the plug assembly of the first tubing section is inserted into the socket assembly of the second tubing section.

40. The method of claim 35 wherein a pair of optical connectors are optically coupled when the plug assembly of the first tubing section is inserted into the socket assembly of the second tubing section.

41. The method of claim 35 wherein the coupling collar of the first tubing section is used to secure the first tubing section to the second tubing section.

42. The method of claim 35 wherein the tubing sections are tubing.

43. The method of claim 35 wherein the tubing sections are pipe.

44. The method of claim 35 wherein the tubing sections are casing.

45. The method of claim 35 wherein the tubing sections are used to produce hydrocarbons from a well bore.

46. The method of claim 35 wherein the tubing sections are used to produce water from a well bore.

47. In a drill string of the type comprising a plurality of drill pipe sections arranged in end to end relation from a location above the ground to a lower location adjacent to an orientable tool connected to a bottom end of the drill string and wherein the adjacent ends of the drill pipe sections are connected to each other to form a plurality of spaced pipe joints extending downwardly from the ground to the tool, wherein each pipe section is provided with a lower end having a downwardly projecting extension and an upper end having a complementary recess which is in alignment with and corresponds with the downwardly projecting extension on the lower end of the same pipe section, and wherein each pipe joint comprises an upper drill pipe section having its downwardly projecting extensions received in the corresponding recesss in the next adjacent lower drill pipe section and wherein the extensions and the recesses can fit together in more than one orientation, wherein the adjacent ends of the sections are threaded and wherein an internally threaded collar is received over the threaded ends to hold the sections of each pipe joint securely together.

48. A drill pipe joint as set forth in claim 47 wherein the upper drill pipe section and lower drill pipe section are provided with keyways which are symmetrically related with respect to the longitudinal axis of the drill string and wherein keys are affixed to the keyways of the upper drill section and are adapted to fit into the keyways of the lower drill pipe section.

49. A drill pipe joint as set forth in claim 47 wherein the upper drill pipe section is provided with at least three downwardly extending legs which are symmetrically arranged with respect to the longitudinal axis of the drill string and wherein the lower drill pipe section is provided with a corresponding number of recesses arranged so as to receive the legs of the upper drill pipe section.

50. An apparatus for connecting a plurality of casing sections together comprising:

a first casing section;

a second casing section removably connected to the first casing section; and

wherein the first casing section and the second casing section are connectable in a plurality of distinct orientations.

51. The apparatus of claim 50 wherein the connection between the first casing section and the second casing section comprises: a means for connecting the first casing section to the second casing section in a plurality of distinct orientations.

52. The apparatus of claim 50 wherein the connection between the first casing section and the second casing section comprises:

a plug assembly having a plurality of splines affixed to the first casing section;

a socket assembly having a plurality of receptacles adapted to receive the plurality of splines of the plug assembly, the socket assembly being affixed to the second casing section; and

a securing device for securing the plug assembly to the socket assembly.

53. The apparatus of claim 52, wherein the securing device is a coupling collar adapted for connection to the plug assembly and the socket assembly, the coupling collar initially engaged with the plug assembly.

54. The apparatus of claim 53, wherein the plug assembly further comprises fine threads.

55. The apparatus of claim 53, wherein the socket assembly further comprises coarse threads.

56. The apparatus of claim 55, wherein the threads of the socket assembly are tapered.

57. The apparatus of claim 52, wherein the two tubing sections are connectable in two distinct orientations.

58. The apparatus of claim 52, wherein the two tubing sections are connectable in three distinct orientations.

59. The apparatus of claim 52, wherein the two tubing sections are connectable in four or more distinct orientations.

60. The apparatus of claim 52, further comprising at least one conduit containing a wire adapted to carry an electrical current.

61. The apparatus of claim 52, further comprising at least one conduit containing material adapted to carry an optical signal.

62. The apparatus of claim 52 wherein the tubing sections are tubing.

63. The apparatus of claim 52 wherein the tubing sections are pipe.

64. The apparatus of claim 52 wherein the tubing sections are casing.

65. The apparatus of claim 52 wherein the tubing sections are used to produce hydrocarbons from a well bore.

66. The apparatus of claim 52 wherein the tubing sections are used to produce water from a well bore.